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## KATANGA'S COMMUNICATIONS AND MINERAL WEALTH

According to information received by *Le Mouvement Géographique* (Vol. 24, No. 24, Cols. 295-298, June 12, 1910), rail laying had been completed for 171 miles on the second section of the railroad which the "Compagnie des chemins de fer des Grands Lacs" is building to circumvent the cataracts and rapids that obstruct navigation on the upper Congo. The first section, from Stanleyville to Pontirville, seventy-five miles, has been in operation for about two years and steamers launched upon the smooth waters above, have been carrying railroad material to Kindu where further obstructions are met. The second section of the road, starting from Kindu, will pass around the last obstructions to navigation and will terminate at Kongolo, just above the Iron Gates. This section is 217 miles long and the road-bed has been prepared for the rails to within twenty-five miles of Kongolo which stands on the left bank of the Lualaba-Kamolondo branch of the Congo.

This enterprise has been hastened as rapidly as possible in order to provide, through the Belgian Congo, a steam route between the mouth of the river and the great mineral field in the southern part of the Katanga province of the colony. Above Kongolo, the river is navigable for light draught vessels for 400 miles farther south. It is expected that the second section of the railroad will soon be in operation; and when trains are running to Kongolo there will be uninterrupted steam transportation along the Congo, by water or land, for about 2,250 miles, from the mouth of the river to Kalengwe Falls, the extreme limit of navigation.

The development of Katanga is now the foremost purpose in the policy of the Belgian Congo; and it is expected that, before very long, a railroad will be extended across the province from the head of navigation to the southern border. Then the mining region will have steam communications on or along the Congo to the Atlantic.

For want of railroad or river communications, Katanga has been almost isolated from the outer world. It is in the heart of central Africa and, until about three years ago, it could best be reached by the Zambesi, at Chinde or Tete, necessitating a journey of hundreds of miles on foot, as the tsetse fly prevented other means of transport. Then, the Rhodesian or Cape to Cairo railroad was completed to

Broken Hill, 250 miles from Katanga's southern border and the mining field could be reached from England in six or seven weeks. A branch of this road has now been extended to the border and England is only four or five weeks away. Another railroad has been pushing inland from Benguela, on the Atlantic. Its ultimate destination is the Katanga mining region. The road-bed has been graded almost to the Bihe plateau and rail laying is considerably advanced, but practically all work on the line is at present suspended.

Mr. J. H. Ivey, mining engineer, has a conservative and able article on "The Mineral Wealth of Katanga" in the *Seventy-Seventh Annual Report* of the Royal Cornwall Polytechnic Society (New Series, Vol. I, Part 2, 1910, pp. 329-342, Penryn), from which the following facts are condensed.

The province of Katanga has been specially favored by nature. It is well watered by the Luapula, Lualaba, Lubudi, Lufupo, and Lufira and their affluents, the whole of which finally coalesce in the Congo. Their trend is from south to north and, with the exception of the Luapula, they take their rise in the mountainous divisions between the Belgian Congo and the British and Portuguese territories. The work of making the Congo-Lualaba system available for a steam route to the Atlantic is outlined above.

The country is generally well wooded, extensive patches of open bush alternating with smaller areas of unwooded lands. The copper belt, trending in a north-westerly, then westerly, direction, in the southern part of the province, includes a large area of sterile and uninteresting country on and about the outcrops of copper ore.

The average rainfall is about fifty inches a year. This is true for that part of the province south of  $10^{\circ} 30' S.$  Lat., but further north, the rainfall is probably much higher.

The country generally lies at an elevation of 2,000 to 3,000 feet. The copper belt is of higher altitude, ranging to 5,000 feet and generally exceeding 4,000 feet. The climate on this belt is ideal and highly suitable to Europeans. Malarial fever is almost unknown, the only dangerous period of the year appearing to be at the change from wet to dry season (May and June) which corresponds with change from hot to cold weather. The early mornings are then often intensely cold, and great care must be taken to avoid chills. Off the copper belt the climate seems less agreeable, being undoubtedly hotter, and malaria, spirillum and blackwater fevers are prevalent.

Prospecting work in Northwest Rhodesia and Katanga was first begun in 1900 under the auspices of the Tanganyika Concessions

Company. The great success of the various expeditions is now well known. The deposits already located include copper, tin, gold, platinum and palladium ores, with coal and the necessary fluxes for smelting, hematite, limonite and limestones.

The outcrops of the copper deposits occupy a belt extending for a distance of about 200 miles, with a width of thirty-five to sixty miles. From Kambove Camp, which may be regarded as a center, the belt extends southeast for about 100 miles. From twenty to thirty miles from Kambove, the course of the belt is northwest, then generally due west to the Quilu river (Dikulive Mine), thirty miles west of the Lualaba. Here it abruptly turns to the south, and has not been traced beyond a few miles. Outside the area of this belt, and chiefly in the southeastern part of the state, are isolated groups of mines, possibly connected with the Rhodesian group of copper mines at Bwana, Mkubwa, Kansanshi, etc. The country rocks of the belt are alternations of sandstones and shales, in varying stages of induration, with limestones and hematite and limonite rocks. The deposits of copper ore occur in folds of the sandstone and shale strata in anticlines, synclines, etc. The greater number are anticlinal and form conspicuous landmarks, as the outcrops are invariably free from bush, with stunted herbage, and also devoid of ant-heaps. Copper exists chiefly as malachite but chrysocolla, azurite and cuprite are commonly found.

Mr. Ivey describes a few of the numerous copper mines on this great belt and among them he speaks of the Fungurume mine which, he says, can be quarried to a depth of 200 feet and is estimated to yield over 4,000,000 tons of ore to this depth, 7 to 8 per cent. being copper. In Kambove No. 2, the cross cuts at the bottom of the five shafts show from 13.3 per cent. to 17 per cent. copper. "These high values and the great extent of the deposits . . . will, no doubt, enable Kambove to rank among the very largest copper producers of the world. . . To enumerate only Dikurwe, Musonoi, Kolweze, Fungurume, Kwatabala, Kakanda, the Kambove and Msesa groups, with Chituru and Likasi is sufficient to warrant all the good things that have been said of the copper prospects of Katanga. There is, without doubt, enough copper reasonably developed, easy to mine, and favorably situated with regard to power, flux and fuel, fully to reimburse the shareholders of the interested companies for all their past and any future contributions."

The tin deposits (cassiterite) were first discovered by the prospectors of the Tanganyika Concessions late in 1903. The Busanga tin area is the best known and its probable extent and value have

been determined. The deposits have been exploited by sinking ninety-six pits, at regular intervals, over the supposed full stanniferous area ( $1\frac{1}{8}$  million square yards). Sufficient work has not yet been done to say whether Katanga is likely to become a large producer of tin from reefs. There is no doubt, however, that the alluvial ground of the Busanga, Kasonso and other areas will, when the conditions are more favorable, yield, at a profit, large quantities of cassiterite. These alluvial deposits extend almost continuously over an area about equal to that of the county of Cornwall, where tin is mined in England.

In the Ruwe region, soil and subsoil of varying depths are often found to carry gold. In the roughly stratified sandstones, the broken up portions are very auriferous, the gold being in flat, angular pieces, sometimes with irregularly shaped nuggets weighing up to nine ounces. Nuggets of two ounces or more are of frequent occurrence. There is also much free gold. The gold is very pure. It is recovered by washing the dirt in riffled sluice boxes. Native labor is utilized in the mining and transport of the dirt and for feeding the boxes, under the supervision of one or two white men. The first six months gave an output of 2,770 ounces at a working cost of \$8,805. Further large auriferous areas were opened out and the yield has occasionally been close to 1,000 ounces for a month's run.

The so-called hanging wall (bedded sandstone) carries small quantities of fine gold.

The "reef" (ore body) of finely bedded sandstones carries with other minerals, gold, silver, platinum and palladium. The ore body has been exposed by shafts, accompanied by driving and cross-cutting, to sixty feet in depth and 1,000 feet along the strike. With platinum at gold value, the writer judges the mine proposition to be worth at least \$10 per ton over five feet of reef.

The labor supply has, thus far, been ample. The "boys" have been recruited from Northern Rhodesia and, with a wise native policy there should be ample labor available from Katanga itself. The cost of labor has been very cheap, running from \$20 to \$25 per "boy" for a four months' contract, this price including recruiting charges and keep.